

# FIG. 1

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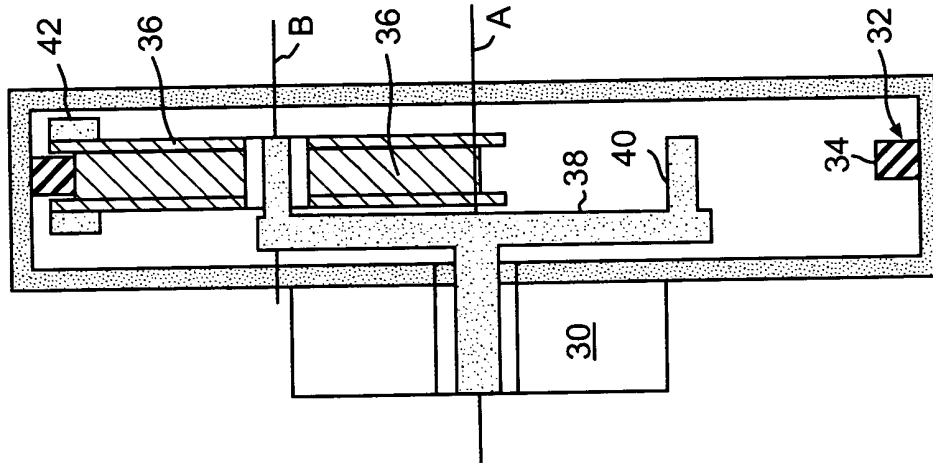


FIG. 2B

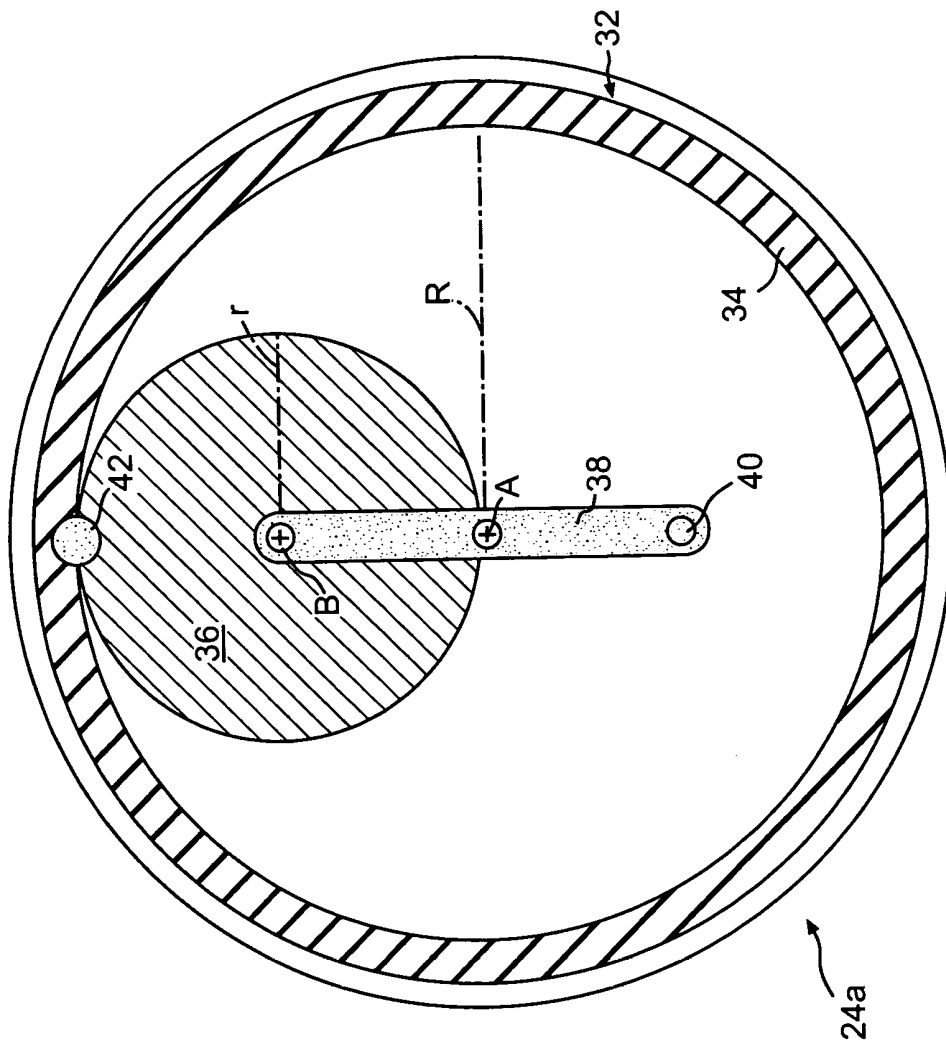
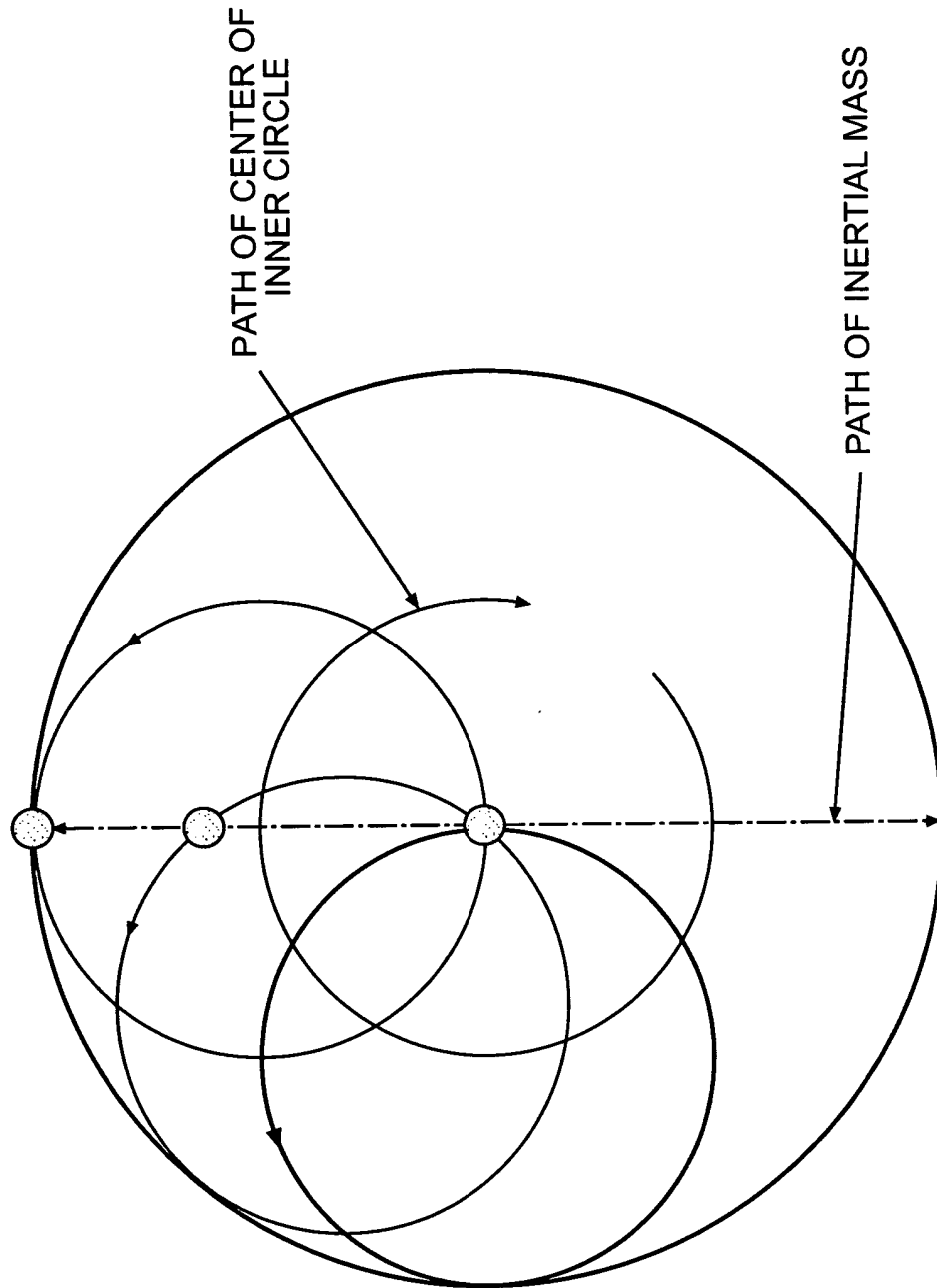
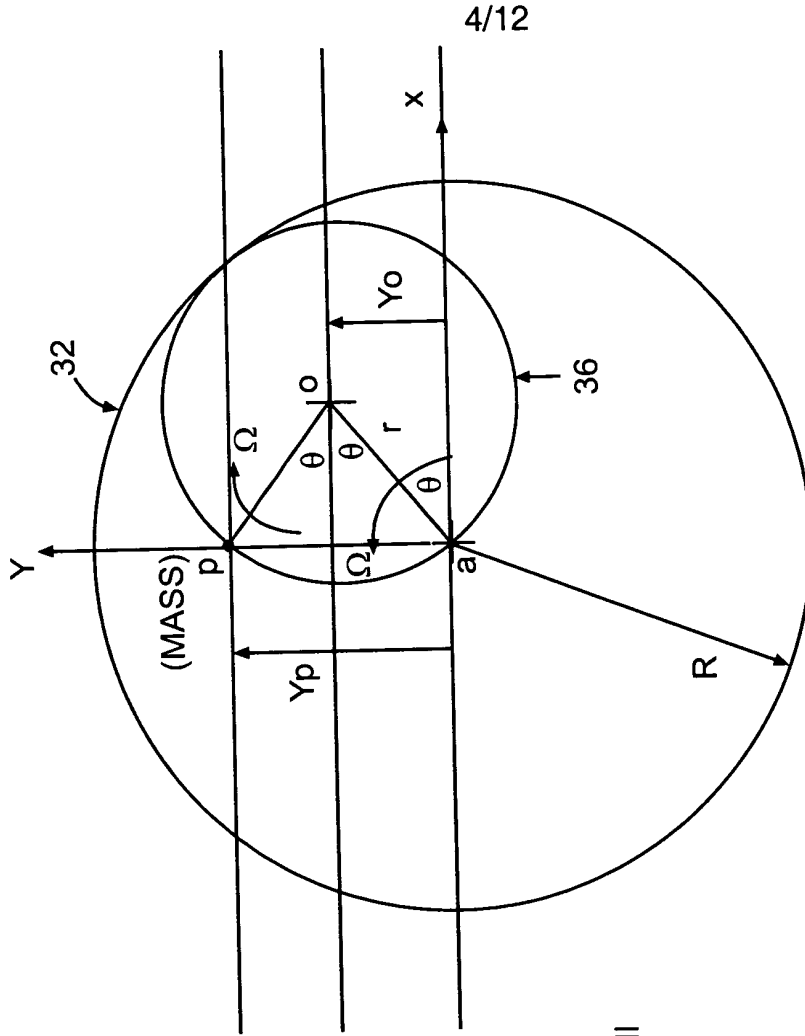


FIG. 2A

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**FIG. 3**



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**FIG. 4**

IMPROVED HARMONIC FORCE GENERATOR  
 EQUATIONS OF MOTION

OUTER CIRCLE WITH CENTER a AND RADIUS R  
 INNER CIRCLE WITH CENTER o AND RADIUS r

$$R = 2r$$

CIRCUMFERENCE OF INNER CIRCLE:

$$c = 2\pi r$$

CIRCUMFERENCE OF OUTER CIRCLE:

$$C = 2\pi R = 2c$$

INNER CIRCLE ROLLS AROUND INSIDE THE  
 OUTER CIRCLE WITH ANGULAR VELOCITY  $\Omega$

AS INNER CIRCLE COMPLETES ONE ORBIT,  
 IT SIMULTANEOUSLY COMPLETES ONE  
 REVOLUTION ABOUT ITS CENTER.  
 THEREFORE THE ANGULAR VELOCITIES OF RADII  
 ao AND op ARE IDENTICAL.

POSITION OF POINT p ALONG Y AXIS:

$$Y_o = r \sin \theta = r \sin \Omega t$$

$$Y_p = 2r \sin \Omega t$$

VELOCITY OF POINT p:

$$Y_p (\text{dot}) = 2r\Omega \cos \Omega t$$

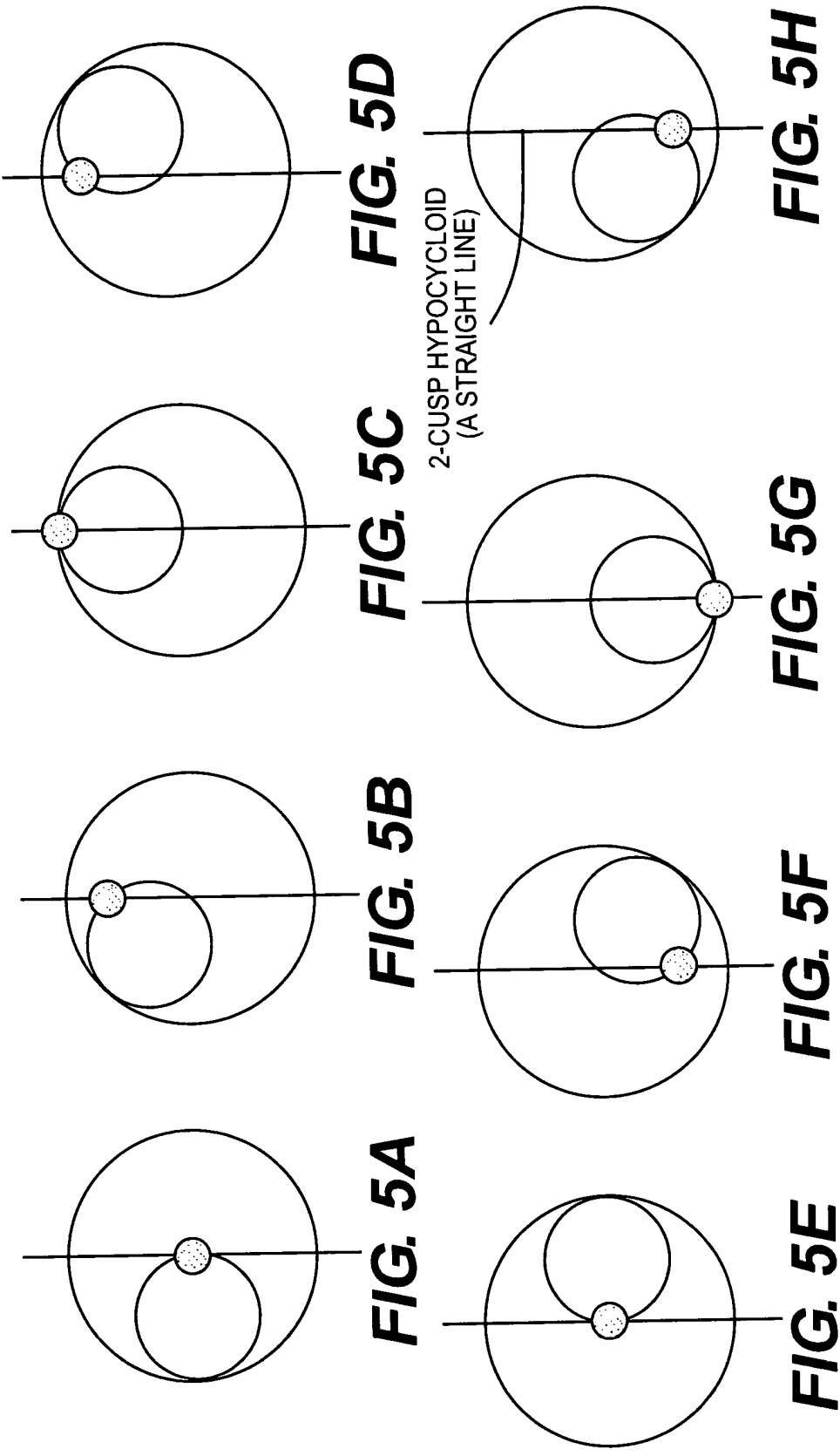
ACCELERATION OF POINT p:

$$Y_p (\text{ddot}) = -2r\Omega^2 \sin \Omega t$$

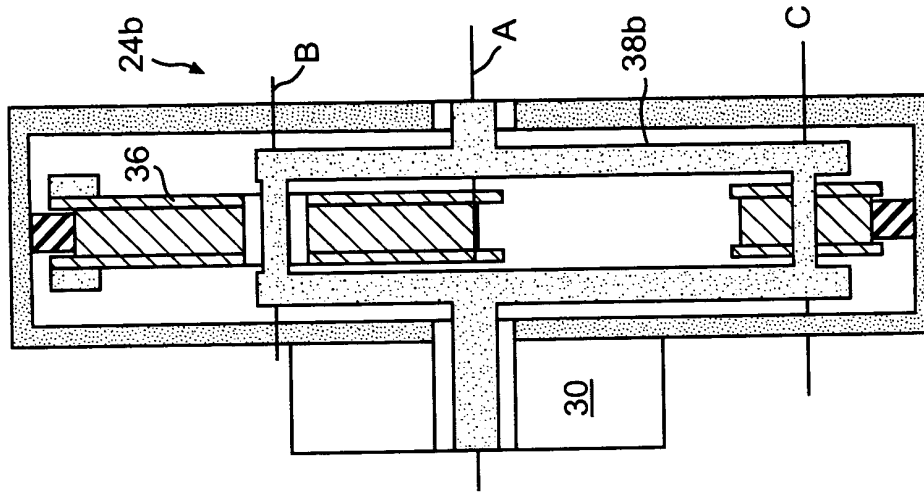
INERTIAL FORCE GENERATED BY a MASS AT p:

$$F = ma$$

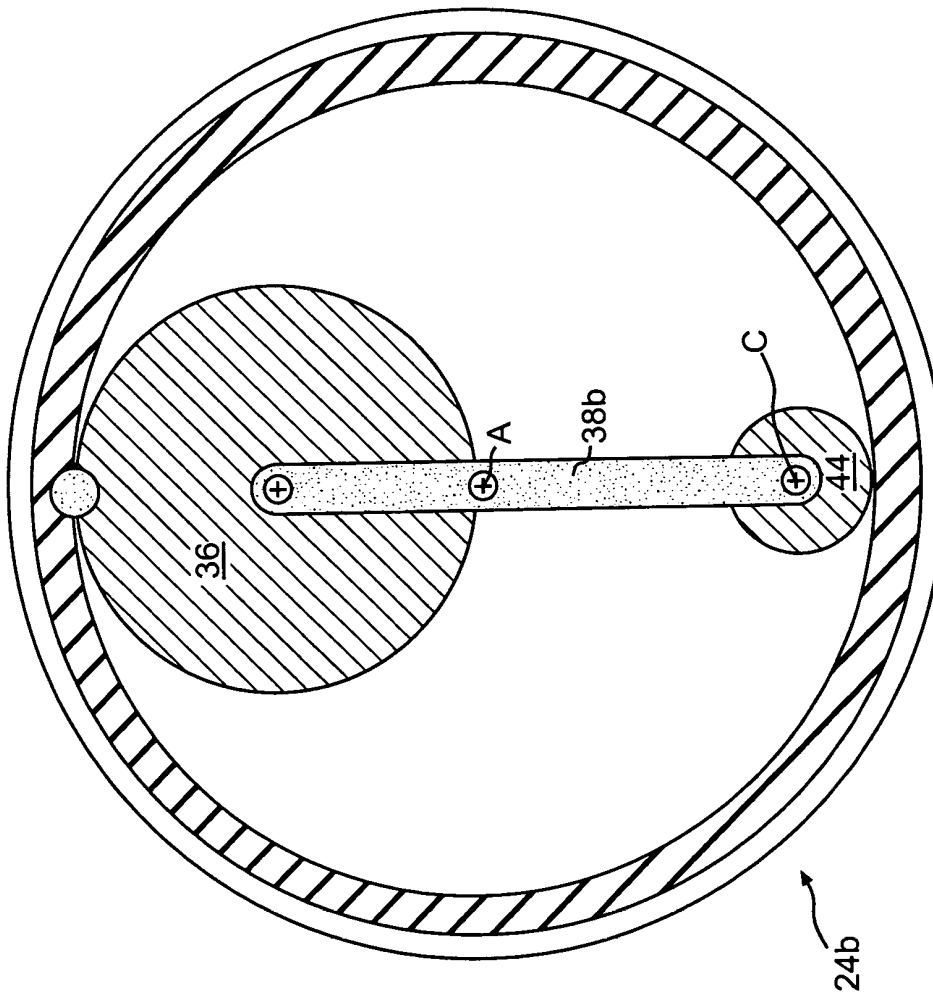
$$F = mR\Omega^2 \sin \Omega t$$



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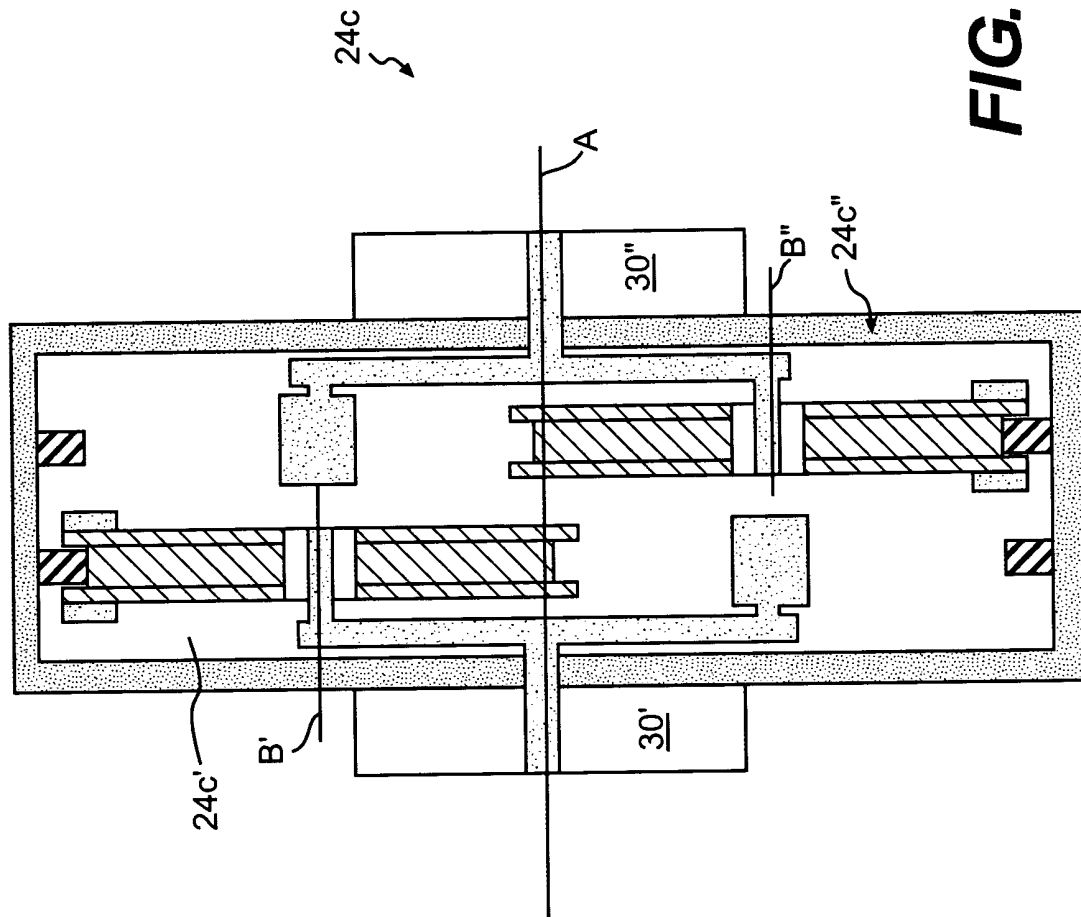


**FIG. 6B**



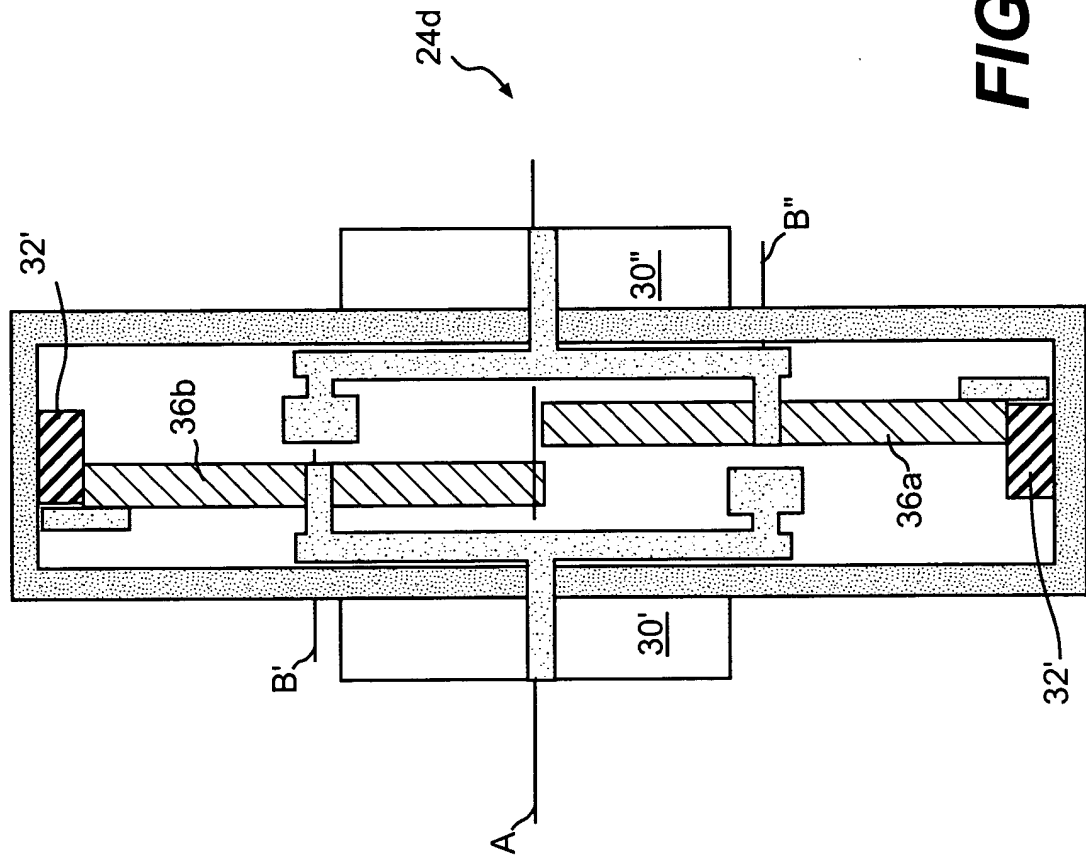
**FIG. 6A**

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**FIG. 7**

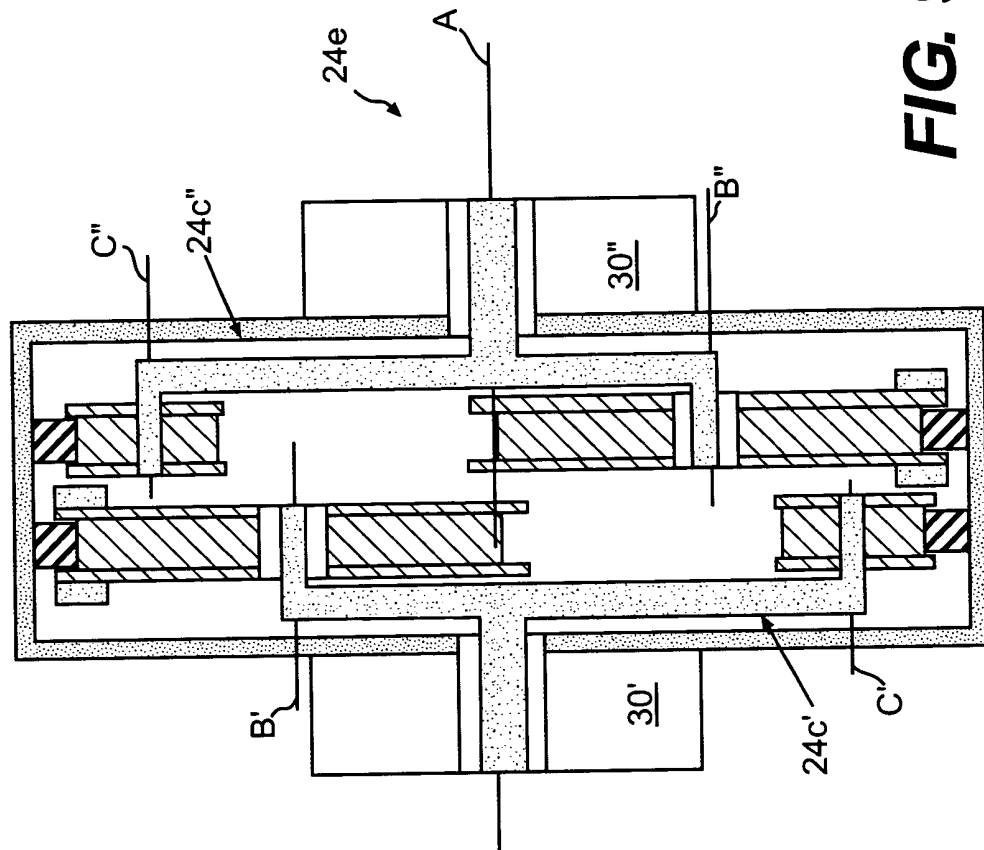
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**FIG. 8**

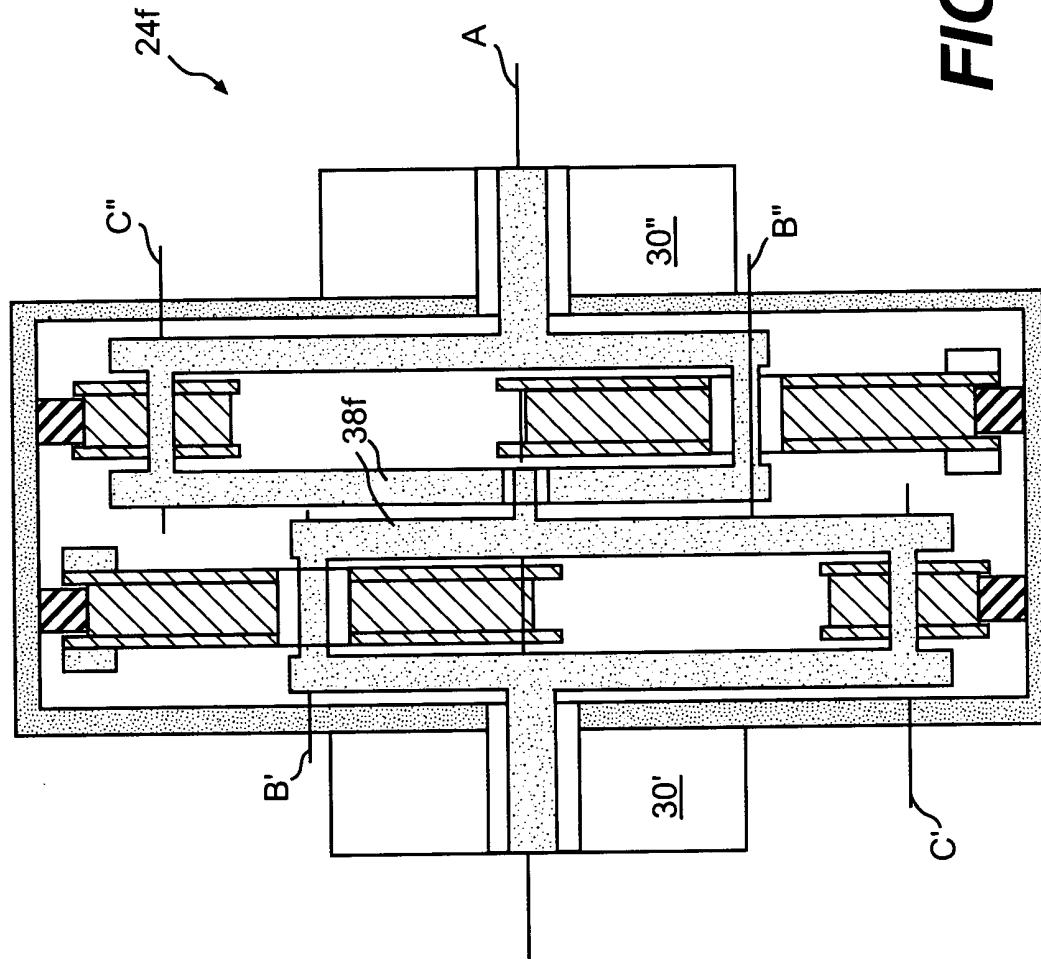


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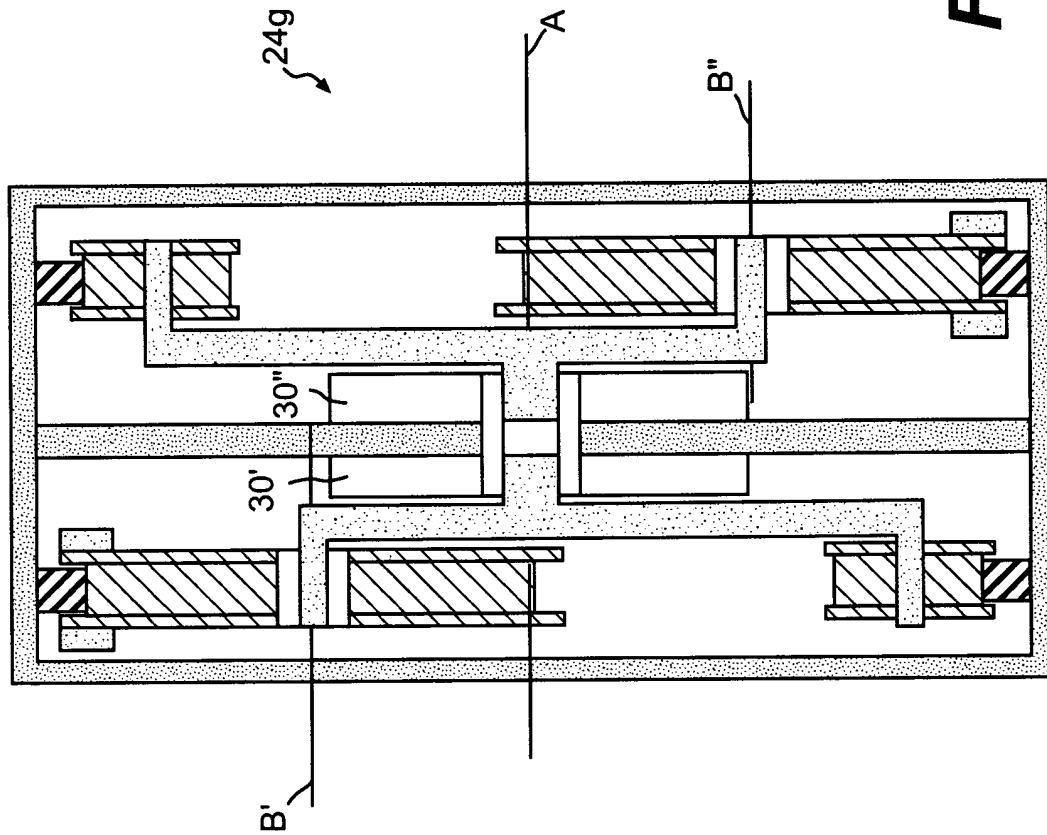
**FIG. 9**

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**FIG. 10**

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**FIG. 11**

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**FIG. 12**

